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THE RHINO LIKES VIOLETS

BY KAREN PRYOR

This article appeared in *PSYCHOLOGY TODAY* in April, a month after our Zoo began its elephant training program, and is reprinted here with permission of the author. Trained as a biologist, Pryor is a consultant on animal behavior to environmental groups and government agencies. She has published numerous articles in scientific journals on learning and behavior, and is currently at work on a book about training animals and people.

We sat on the ground just outside the rhinoceros enclosure. Mary, an adult rhino, put her very large head through the fence, resting it on the bottom railing so that her chin overhung my lap.

Since I was sitting in a patch of violets, I picked some violet leaves and fed them into her huge jaws. She took them with apparent pleasure. She seemed, too, to enjoy having me stroke her mouth and face. The heavy skin that looked like armor plating felt like suede; it seemed to be very sensitive.

Mary could not see which way to turn for more leaves, even if I held them up to her eyes, but if I touched her face with the greenery she oriented easily and folded in the leaves adroitly.

Mary's ears tilted calmly and pleasantly to keep track of the whereabouts of her baby and to follow the conversation between Melanie Bond, a keeper at the National Zoological Park in Washington, D.C., and me, a visiting consultant.

We had just finished a training session with the great apes, part of an experimental program at the zoo, to see if modern, nonforce behavioral modification techniques could be of use in handling zoo animals. Now, while we took a break in the spring sunshine, Melanie was playing with Mary's baby.

Using violets and petting as rewards, she had just taught the baby to pick up one of its front feet on command, as horses and elephants are trained to do. The baby was quite excited at discovering such an easy way to earn Melanie's attentions, and between bouts of foot raising it gamboled clumsily about, now and then bumping heftily into its mother.

The half-hour of play reinforced for me a concept I'd long been aware of. If you have something an animal wants, you can train virtually any animal. People often don't realize how easy it is to train even difficult, dangerous animals without knocking them around.

I wouldn't have dreamed of going into the rhinoceros enclosure and trying to train either animal by force, like an old-fashioned circus trainer. But obviously one could shape rhino behavior with positive reinforcements: in this case, greens and, I think, attention and diversion.

Shaping behavior with positive reinforcement is a technique described in the laws of learning first defined by B.F. Skinner and generally called operant conditioning. In the last 20 years or so, the technique has revolutionized animal training.

All dolphin shows are based entirely on positive reinforcement, not aversive control. You cannot use a whip or a bridle, or even your fist, on an animal that just swims away.

Bird shows involving free-flying birds of many species have proliferated; birds, too, cannot be trained by force (they just panic) but will work hard and learn well for food rewards.

In Hollywood, shaping with positive reinforcement is called "affection training," and it has produced results that in the past would have been considered impossible: the Hartford Insurance stag is one example.

I gained my background in the applied uses of operant conditioning as the head trainer and curator of Sea Life Park, an oceanarium in Hawaii, where we trained dozens of dolphins, small whales, birds, and other creatures for both public performances and research. Positive reinforcement, properly used, could produce spectacular shows.

Sometimes, though, I was even more impressed with its practical value in the everyday maintenance of our animals. For example, some whales are too large to restrain by force, so when our whales needed veterinary attention, we trained them to present their tails and allow blood samples to be taken and shots to be administered, for a reward of food and petting.

(The amount and kind of reward is not important; what is important is that the animal know exactly what it has to do to get the reward).

All of our animals were trained to move from tank to tank on command; they did not have to be chased or forced. And we used training to relieve the boredom of dolphins that were being kept in solitude; for dolphins, boredom can literally be fatal.

I had then been asked to see if the same techniques could be applied to wild animals in a zoo, thus I found myself feeding violets to the rhino.

Theodore Reed, director of the National Zoo, had read a book I'd written about my porpoise-training experiences and had decided that these techniques might be useful to his keepers.

He mentioned specific behavioral problems to me: the polar bears that banged on their steel doors hour after hour; the giraffes that sometimes refused to go indoors before a cold snap and had to be chased about by 10 men with sticks in a slipping, kicking, cursing, and risky rodeo; the chimp that sat in a corner all day plucking the hair out of its arms from boredom.

Reed, a veterinarian, was also worried about boredom among the keepers. He prided himself, and justifiably I was to discover, on a staff of intelligent, capable men and women who took serious interest in the animals they cared for. But a lot of the work of animal care is grueling drudgery: feeding and cleaning, cleaning and feeding. Reed thought that for those who took to it, ongoing training interaction might add interest to the keepers' lives as well as the animals.

I agreed to go to work for the Zoo as a consultant, teaching a group of keepers as much as I could about training techniques.

Twenty-five people came to the first class: young, old, male, female, black, white. I was intrigued not only by the variety of lively faces, but also by the variety of animals they had to work with: birds, reptiles, apes, elephants, mammals I'd never heard of such as grisons and binturongs.

I explained that it would really not be my job to train animals, not to solve specific problems, necessarily, but to give the keepers the tools by which they could do those things.

I outlined a basic technique: you let the animal discover that every time you blow a whistle, it gets a piece of food. Then you let it discover that it can make you blow the whistle by, say, moving toward its den.

Presto. You are training the animal to move into its den. Or it is training you to be reliable about whistle blowing and food giving, depending on the point of view.

Everyone had to pick an animal to practice on and a behavior to shape. I recommended choosing a lively, greedy animal.

ON THE COVER

Trick and Treat, Milwaukee County Zoo twin orangutans, born in Madison's Vilas Park Zoo on Halloween, 1974. They represent two-fifths of the oranges now living in the United States, born in captivity. Story on page 8.

Melanie Bond, in the great ape house, had dandy subjects to start with — two juvenile orangutans. Keepers had been forbidden to play or interact with the apes, on the ground that it was dangerous, but now that rule would be relaxed so that Melanie could participate in the training class.

Bela Demeter, in the reptile house, was dubious about training snakes or lizards, but I knew reptiles could be conditioned; the late reptile collector Grace Wylie had had a number of trained alligators years ago.

Birds, reindeer, elephants — everyone picked good subjects.

However, Art Cooper in the lion/tiger complex had fixed his heart on training his best tiger, Peela. "No, Art," the others protested. "Peela never does anything! He just lies on the top of his hill all day. What are you going to reinforce?"

"Well, he's cool," Art explained. "He's saving his strength."

Art intended to persuade this cool cat to

- come down to the front of the exhibit, to the edge of the moat;
- get into the water in the moat;
- retrieve a floating beer keg that was sometimes put in the moat as a tiger toy (tigers like to swim, and like all other cats, they will play with moving objects);
- put the beer keg on the beach;
- get back up on shore himself.

A five-step behavior chain, and quite difficult even for a seasoned trainer, especially with a disinterested animal. I suggested doing something simpler, but Art's mind was made up.

Training is time-consuming, and some people found that they could not easily fit it into an already overcrowded day's work. Curators, too, sometimes objected to the keepers' frittering away valuable minutes on apparently trivial tasks.

"I do not see the value," one curator huffed at me, "in training the panda to stand on its head to impress the other keepers."

The value, of course, was in the process, not the product: the trainer was learning to train. What he or she chose as a practice behavior was irrelevant to me. I have found that first-time trainers make much better progress if

they choose their own task rather than have one assigned to them, so I let them do what they like.

But I could empathize with the practical zoo people who not only saw no point in the particular behavior (who needs a retrieving tiger, after all?) but felt that it interfered with the animals' "natural behavior" as well.

In a few weeks, some people had successes to demonstrate to the class.

Melanie had trained Junior, one of the young orangutans, to clean up his cage and toss trash into her bucket in return, not for a food reward, but for the chance to blow on a whistle. Junior was fascinated by the whistle.

Next to his cage there was a large female orangutan who seemed to me to be suffering from clinical depression. She sat slumped against the wall all day long, looking like an exhausted shopping-bag lady. Melanie, with food, taught her to play a simple Simon Says: I pat my head, you pat your head; I clap my hands, you clap your hands; I rub my stomach, you rub your stomach.

To everyone's amusement, the orang discovered she could play this game with the public, especially with groups of schoolchildren. It was gratifying to see her, active and bright-eyed, clapping her hands, then rubbing her stomach, while a corridorful of hilarious children copied her.

Melanie also began playing the training game with melancholy Ham, the chimpanzee, our first U.S. chimp in outer space, now a grown male with formidable fangs. She paid him with food for various actions, and slowly, he began to participate.

One morning, Melanie informed us, she was about to let Ham outdoors after having given him his breakfast. When he saw that she was going to open the outside door, he graciously rewarded her by handing her a piece of celery. He understood the game.

Grayson Harding, in the small mammals building, had trained a chinchilla to weigh itself by hopping in a basket which could then be put on a scale — a big improvement over chasing it all over the cage with a net to catch and weigh it.

Bela, at the reptile house, had trained two thin green lizards about 18 inches long to take

insects from the tip of a forceps. He then held the forceps higher, shaping an upward jump.

By the time he showed the behavior to the class, the lizards ran to the cage door as soon as he opened it and then, eyes bulging and pink, toothy mouths agape, jumped two feet straight up to the forceps tip with a tiny ferocity that was funny to see.

Bela really did have leaping lizards. He himself wasn't impressed, though I pointed out that this Olympic-effort, straight-up leap is the high point of all dolphin shows and is trained in exactly the same way.

Meanwhile, Art actually was making progress with Peela. Peela got into the spirit of things and came bounding down the hill when he caught sight of Art. He learned to get into the water and to get out. He played with the keg.

Training sessions, however, took a long time, because Peela appeared to have trouble making up his mind. He could take 20 minutes to get into the water and 45 minutes to get out again. It's a trait common to cats, as anyone knows who has ever opened a door to let an importunate house cat out and then had it stand in the doorway. Peela just did it on a bigger scale.

In the long run, Art did accomplish his behavior chain and, I am sure, acquired in the process training skills that can be applied henceforth to any animal in his care.

By the end of the program, Melanie's work with the apes was generally recognized as valuable; Barbara Bingham had some partially trained reindeer and had discovered that currying was reinforcing to them. The giraffes now came indoors when the keepers rang an electric bell.

A few keepers, a few animals had benefited. The program had been fun for the participants, but did it have any value for the whole zoo?

Six months later, I went back to see.

In the elephant house, where training sessions had previously been brief, with fixed routines, and held before opening hours, training demonstrations were now being given daily for the public.

In the great ape house, morose Ham now laughed, played games, and even let himself be tickled. Gorillas opened doors and tidied

cages on request. The zoo had sent Melanie to night school to learn American Sign Language; she was teaching Junior.

I found that keepers were being hired specifically for their training skills.

A Hollywood-trained keeper had all the bears going indoors on command for a food reward. Previously, it had sometimes been necessary to chase them in with fire hoses in order to clean the yards.

A new seal and sea lion exhibit, Beaver Valley, which had been under construction during my time at the zoo, was being run by an experienced trainer.

On the site where I had once stood and listened to a head curator worry about how they would ever catch an individual seal for medical care since the pool was so large, I was now able to look over the completed pool and its barking inhabitants and hear a curator tell me that every animal was being trained to come out of the water on command and that he considered training to be integral to the staff's daily work.

The polar bears had also come under the care of the Beaver Valley keepers. They had noticed, I was told, that one of the bears had a broken canine tooth. This called for veterinary attention, since a broken tooth can get infected.

Customarily, the bear would have had to be "knocked down," or shot with a tranquilizer gun — and with a stiff dosage, too, since you certainly do not want a polar bear to wake up while you are examining its teeth.

To spare the bear this risky and potentially even fatal procedure, keeper leader Kayce Cover and her staff trained the bear to stick its nose out through a slot in the door and allow its lip to be lifted.

When the behavior was shaped, they called the vet, the trainer signaled the bear, the bear poked its nose out, and the vet inspected the tooth and pronounced it healed. No trouble at all. And they did it with raisins.

That, I thought, was exactly the use of training as a zoo-management tool that Dr. Reed had been hoping for.

The incident had nothing to do with me or my class, directly. The keepers had learned their obviously excellent training skills from others.

But their success depended on a favorable climate of opinion at the curatorial level, in which such keeper-animal interactions are not forbidden but permitted, perhaps encouraged, maybe even expected. There, I thought, our class may have broken the ice.

What about other zoos? At the New York Zoological Park — the Bronx Zoo — director William Conway and some of his curators have also been interested in operant conditioning as a zoo-management tool.

They have installed some automated exhibits, such as a "honey tree" that makes bears stand to their full height and show off their long tongues to get the occasionally dispensed honey.

They have also undertaken a pilot training program, hiring an experienced marine-mammal trainer, Jerry Winsett, to be trainer-at-large in the zoo for a year. Some of the behavior problems Jerry solved seemed routine to him, but they were serious to the keepers.

For example, a certain gorilla took to sitting in his doorway, refusing to go in or out, when the keepers wanted to clean the cage. No amount of banana waving could coax him from that position, and with his huge strength he prevented the door from being closed.

Jerry pointed out that banana waving is bribery; you are reinforcing behavior that hasn't occurred yet, and trainers know that that doesn't really work. Jerry suggested ignoring the gorilla when he sat in the doorway and rewarding him when he went out by himself.

Problem solved.

The Bronx Zoo has an exhibit of nocturnal creatures, "The World of Darkness," in which many small birds and mammals are displayed under a dim or red light, going about their normal lives.

It is difficult for the keepers to check on the health or even the viable presence of each specimen in the darkness.

Jerry taught the keepers techniques for "shaping" animals to come to their hands. To coax a timid douroucouli (a nocturnal monkey) or galago (a tiny primate) to take food from your hand might take weeks of patience.

To shape it to do so, however, by reinforcing every step closer to you with morsels of food,

which at first are put in a dish or on a branch where the animal can reach them easily, is a matter of a few five-minute training sessions.

Now almost every important specimen in that exhibit is shaped to take food from a keeper's hand every day, which not only allows the keepers to count and inspect the fragile creatures but also facilitates catching animals who must be doctored or moved.

The Brookfield Zoo near Chicago has experimented extensively with automated exhibits in which animals are conditioned to show natural behavior, such as hunting, and are reinforced when the behavior is performed correctly by food from an automatic dispenser.

Moral and esthetic objections are often loudly voiced in the zoo community to this "mechanizing" of the animals, but surely it is kinder to keep them active than to let them doze their lives away in hopelessness and apathy.

Properly designed, automated exhibits appear to be fun for the animals. Brookfield's cougar, which was conditioned to lie on a branch until an artificial marmot (a sort of ground squirrel) stuck its head out of a hole and then to leap on the marmot before it disappeared again, would go on playing long after the food dispenser was empty.

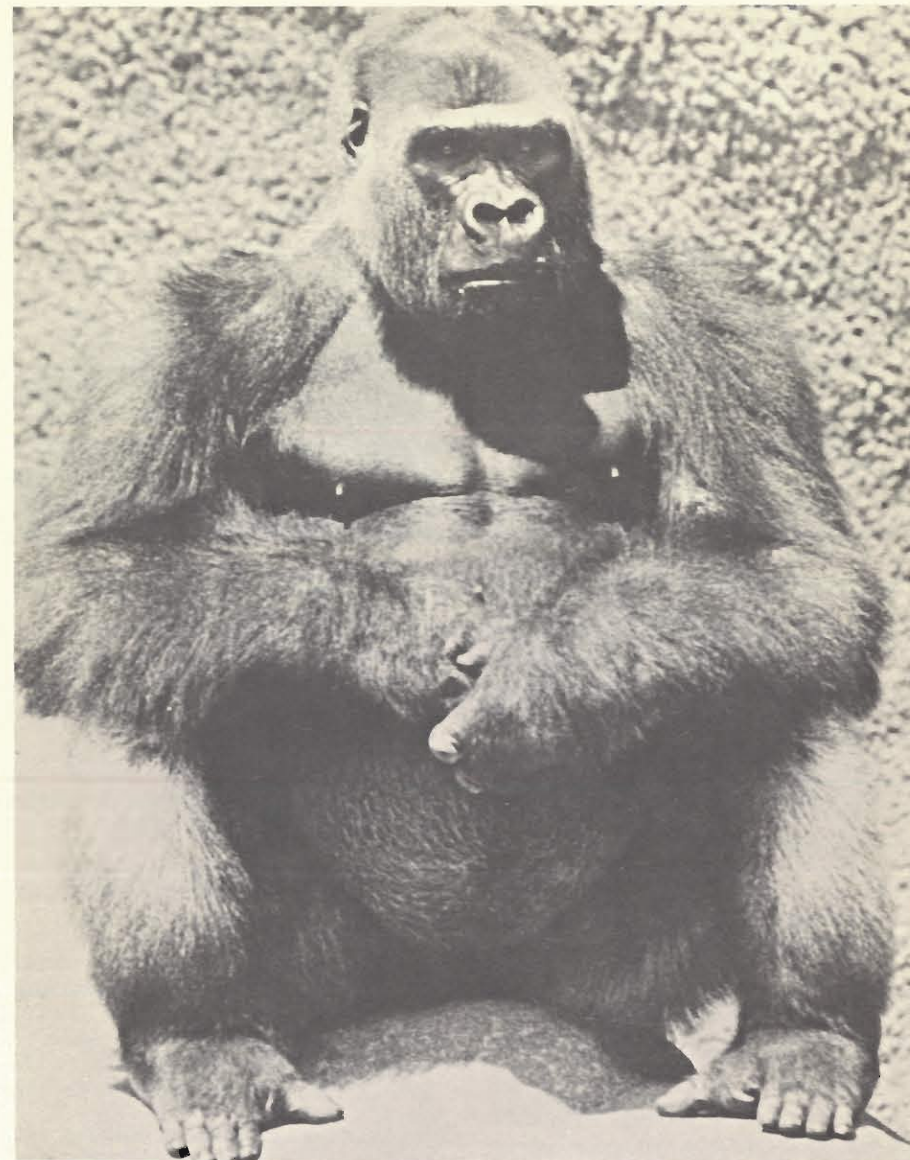
Humanists often view operant conditioning, or any use of Skinnerian techniques, as inhuman, monstrous, Machiavellian. Yet with captive animals it is more often the failure to use the techniques that is inhumane.

Positive-reinforcement training constitutes an exchange of deeds for goods in which a pleasant communion arises, a salutary sort of equality between animal and trainer.

One cannot work without the other, and both must do their part. That is reinforcing in itself, for both parties.

I was just as pleased, just as reinforced, by Mary the rhino's taking violets from my hand as she was pleased to eat them. The baby rhino's learning to pick up its foot so quickly was reinforcing to Melanie.

Operant conditioning in zoos is not only a benign addition to animal-management practices, but rewards staff and animals alike. I am sure B.F. Skinner would not be surprised to hear that. He would just wonder why it took so long.



Diane Coming Here From L.A. for Tanga

A possible mate for Milwaukee Zoo gorilla Tanga, 22 years old and still not a father, has been located in Los Angeles, Zoo Director Gilbert K. Boese announced recently.

She is Diane, 17, who will be flown here from the Los Angeles Zoo as soon as arrangements can be made. It is hoped a Milwaukee private jet owner will transport Diane. She will be tranquilized, Boese said.

Living in a group now, 218-pound Diane dominates the three other females and one male who comprise her associates, indicating that she does have a certain presence. According to primate area supervisor Sam LaMalfa, that bodes well for a match with Tanga, who, at 407 pounds, has a certain presence, too.

Gorillas exercise selection in this process not unlike humans, LaMalfa said, and neither seems likely to be attracted to bland characters.

Gorillas are extremely endangered in the wild and in captivity, so a match resulting in healthy young is highly prized.

Hopes for offspring here have been encouraged by the remarkably high results of Tanga's fertility test, the fact that for the first time in its history the Zoo has a fulltime veterinarian, Bruce Beehler, on its staff. And further, that a crisis committee of area pediatricians, neonatologists and pathologists has formed to aid Beehler in the event of newborn primate illness, or rejection or mistreatment by the mother.

The Zoo used the international species inventory system (ISIS) in the gorilla search, and contacted 20 zoos in all.

Pre-School Ed Backed

Development of a Zoo education program for pre-schoolers will be underwritten by a \$15,000 grant from the Faye-McBeath Foundation. The Zoological Society requested the grant to back the first-of-its-kind zoo program designed by Zoo education director Mary Krause.

It encourages use of the Zoo as an education facility, and will supply kits to be used by parent-child teams to emphasize sensory, motor, language and math development.

UW Student's Tests Confirm Retardation

This account of the work of University of Wisconsin-Madison student Anne Savage is by Milwaukee Journal education reporter Jeff Browne. It appeared in the Journal, March 25, and is reprinted here with permission. Savage and Treat are in the photo by Kay Fischer.



They seemed so human. They smiled. They pouted. Their antics were those of playful red-headed toddlers.

To Anne Savage, their piercing stare conveyed a warmth and depth of feeling of almost human dimensions.

They showed an abundance of affection for one another. If separated, one would complain with an agonizing childlike scream.

Of the tens of thousands who have peered at these 6-year-old twins, few noticed one further human facet in their behavior.

One cannot climb very well. She seems less alert and coordinated than her brother. The careful observer might wonder: is she depressed?

No, she is retarded. Her name is Treat, and she might be the only retarded orangutan that ever survived to age 6. A college sophomore's painstaking study of that retardation may help improve management of the retarded within the animal kingdom. And it could further the understanding of learning among human infants as well.

Every Milwaukee County Zoo regular knows these twins as Trick and Treat. Born in Madison's Vilas Park Zoo on Halloween, 1974, they moved two months later down the hall from Samson, the famous gorilla.

Savage, a zoo patron since childhood, entered the University of Wisconsin-Madison as a freshman interested in the psychological development of the handicapped.

As a student at Milwaukee's Hamilton High School, she had worked with autistic children. For a class project on primates last spring, Savage went to the zoo, and she met Treat.

"I looked at her for two hours," she said. "I was really baffled. I knew something was wrong."

At birth, Treat had been unable to grasp her mother for feeding. The twins had been artificially nourished in a special incubator in the UW-Madison Primate Research Center. Treat had never developed normal motor skills nec-

essary for survival outside of captivity. In the wild, she would have died shortly after birth.

In these twins, Savage saw personalities vastly more complex than those of mere animals behind bars. She decided to apply human tests to the creatures.

Savage spent much of her spring vacation last year testing Trick and Treat for progressive developmental skills normally found in human infants.

Both twins passed the test of a healthy human infant between three and nine months.

Savage then moved to a more advanced stage of infant development. She showed the twins a box with food inside, then closed it. A normal human nine to 12 months old can figure out that the now-invisible food remains in the box. So could Trick, but this puzzle stumped Treat.

Then Savage moved on to more complex tasks. At age 12 to 18 months, a human infant is expected to use a tool, such as a stick, to retrieve an object. Trick learned to do so quickly. But Treat would sit around her cage chewing on the stick.

Trick had no problem with a more complex task, one that a normal infant can handle at 18 months. Treat made no effort.

In human terms, Treat seemed mentally retarded. So Savage spent almost all of her summer administering a more complex set of tests commonly used on monkeys. She learned, among other things, that Treat was capable of learning.

In one test, food was hidden under one of two distinctly different objects, and the orangutan

Milwaukee County Zoo director, Dr. Gilbert K. Boese, was singled out by Savage for his continued support of her research here, which she said was instrumental in its success. And she recognized as "invaluable" the assistance of Zoo staff members Sam LaMalfa, Bob Czapski, Mike Klipstein and Carlo Tarantino. She said their patience, guidance and help formed a constant source of inspiration for her.

Intelligent Orangutan Turns Psycho

By Anne Savage, Junior
University of Wisconsin-Madison

In the hopes of forming a new social group, Trick and Treat were moved to a new cage and introduced to female orangutans Saba and Sabtu.

From the beginning, Trick refused to accept them. Everytime they approached him, he ran away, avoiding any type of interaction, while Treat readily accepted the new playmates.

It was then decided to introduce Sabtu alone. But it made no difference to Trick — he continued to avoid all contact.

When the four were not together, the twins were separated from Saba and Sabtu by an expanded metal door, which allowed them to investigate one another from safety.

Treat took the initiative, approached Saba and Sabtu, and gradually came to exchange pieces of burlap, hoses, and anything else that could pass between the bars. Trick, on the other hand, displayed the classic pattern of protest-despair-depression.

Initially, he turned self-destructive, biting his thumbs and purposely falling from the barred ceiling. Later, he stopped eating and lost 13 pounds. Finally he regressed to huddling in the fetal position.

To alleviate his depression, several therapies were employed:

- He was given a variety of objects for added stimulation. He soon became bored and returned to huddling.

- The twins were taken on walks outside, which they enjoy very much. While outside and for a few hours after the walks, the depression would disappear. But there were no significant long term effects.

- To minimize the stress of accepting Sabtu, smaller, less threatening animals were introduced: a rabbit, a duck, a dog. But Trick ignored all and continued to pace nervously about the cage.

Since Trick's condition did not improve with therapy, the twins were moved to yet another new cage. Within a few hours, there was a remarkable change in Trick's behavior. He no longer huddled in the corner. He was back to his old self, playing on the jungle gym, rolling his tire, and amusing the spectators. While Treat, who showed no adverse effects from this third move, cautiously explored her new home.

With everything back to normal, I administered my last test, known as matching-to-sample. It is one of the more complex tasks for any non-human primate to solve.

In the sample phase, the subject is given one object to displace for a desired food reward. For a correct match, the subject must then choose the sample object from an array of various stimuli.

Though the data has not been statistically analyzed yet, it appears Trick is capable of solving this problem, while Treat has not solved it to date.

was observed trying to figure out which object bore a raisin or a peanut. As soon as the orangutan selected the correct object ten times in a row, the "object discrimination" task was considered mastered.

Trick mastered the first test in about 40 tries and gradually improved day to day until, by the sixth test, the male orangutan virtually never missed.

Meanwhile, Treat took 120 tries at first but gradually improved until she was doing almost as well as her brother after 17 separate tests.

On more complex tests, Trick displayed comparative genius. However, Treat showed no improvement from week to week.

Charles Snowdon, a UW-Madison primate research expert, is Savage's adviser on the project. He helped Savage last fall on a series of neurological tests. They determined, for example, that Treat still exhibited a so-called Babinski reflex, a tendency when the foot is touched in newborn infants for the toes to flare rather than curl.

Snowdon said the research raises questions that will be explored by Savage and others. Among them:

- What are the limits of orangutan intelligence? Trick has proved so far superior to Treat that Snowdon believes these two primates may represent extremes in intelligence.

- Are primates capable of recovering from minor neurological and brain damage caused by the birth process as humans have shown to be?

- Can relatively simple tests be developed to help zookeepers diagnose primates' capabilities and help them make decisions?

This question takes on special significance in Treat's case. Negotiations once were underway to loan Trick and Treat to a zoo in Singapore. Savage believed, and zoo officials agreed, that the new environment might have been too open for as dependent an orangutan as Treat.

Instead, Treat is being gradually integrated for the first time with other orangutans in the Milwaukee County Zoo.



THE PICNIC

The 10th Annual Picnic for Zoological Society members and their families, June 18, offered the 5700 who attended an idyllic evening in the zoological gardens. Society directors, Zoo staff, Zoo Pride, two bands, 24 clowns, one mime troupe, the animals and the weather, cooperatively presented the evening.

Left: Lake Evinrude picnic scene. Below left: Society president Thomas S. O'Byrne announcing one of the shows. Center: a captivating Tripoli clown, a family gathered. Right: Friends Mime Theater set-up, the Pride Zootique.

Kay Fischer photo: Lake Evinrude, O'Byrne, family picnic and Zootique. Rob Eifert photo: Friends Mime and the clown.





Tara Mother-To-Be

Milwaukee County Zoo gorilla Tara, 22, now on breeding loan to Chicago's Lincoln Park Zoo, is pregnant. She has passed her fourth test, according to Lincoln Park curator Mark Rosenthal. And according to Milwaukee primate area supervisor Sam LaMalfa, looks pregnant.

"Yes, you can tell," LaMalfa said after a trip there in late July. "We are expecting in December." The father is Frank, 17 years old and already the father of six.

Life has been a mixed bag for Tara to this point. Never a mother, she has endured fame as a result of her well-known unsuccessful pairing with King-of-the-Zoo Samson in 1978. And more fame when the experience was repeated a year later with Lincoln's King-of-the-Zoo Otto. Neither in the Milwaukee match was interested. Otto was, but she wouldn't let him near her.

What turned her around? LaMalfa calls it love at first sight. He has known Frank since he was a babe (since the gorilla was a babe) and recalls the only exceptional thing about him was that he was not cute, was not chubby, was simply a miniature version of a grown gorilla. Unlike former prospects, he has never been star of the show.

Frank and Tara live now in a group of 22 gorillas, which has involved some adjustments for Tara who, says Rosenthal, is just a bit stand-offish. She has occasional spats with other females, but nothing troubling, he said, since gorillas can have good days and bad days just like another well-known species.

Rosenthal said his primary concern is the well-being of the gorilla baby. Although he would prefer mother's care, he is prepared to hand-rear it if necessary. (Captive gorillas often do not know how to care for their young.)

If all goes well, both Milwaukee and Lincoln Park will benefit from the Tara-Frank bond. The breeding loan agreement specifies alternating ownership of the offspring.

Breeding Loans

By Robert Bullerman
Assistant Zoo Director

Breeding loans have become a significant part of the animal management program at Milwaukee County Zoo.

The breeding loan agreement itself is a legal and binding document for both owner and borrowing zoo. It defines the purpose of the loan and the animal involved, using every possible means of identification: common name, zoo number, date of birth, ISIS number, and tattoo or ear-tag number.

Requirements specified are that the borrowing zoo provide necessary housing, proper nutrition and veterinary care. It also states that the borrowing zoo will not be held liable for death, and if the animal should die during the term of agreement, the owner zoo is to be provided an autopsy report.

Breeding loan agreements normally specify the owner zoo has first choice of male or female offspring, and that thereafter, the young are to be divided equally between the two facilities.

With no commercial activity involved in the loan, the only monies involved are the shipping charges, and the zoo receiving the animal pays the freight. On return, the owner assumes this responsibility.

Loans remain in effect until either party terminates the agreement with a 30-day written notice.

Breeding loans sometimes are used to ship purchased animals to a zoo which must have

an endangered species permit before accepting it — which can take several months. The breeding loan remains in effect until the purchasing zoo has this permit, then the breeding loan is cancelled, and the transaction becomes a sale.

Recently, a female caracal was traded to the Denver Zoo in even exchange for an as yet unborn male Pallas cat. The caracal went to Denver on a breeding loan, to be cancelled when a male Pallas cat is available, thereby making the transaction an even trade.

The inventory of breeding loans in and out is constantly changing. At this time, we hold 24 animals from ten zoos, and have 102 out on breeding loan to 44 zoos, among them nine wanderer macaques, eight snow leopards, seven ringtail lemurs, six Siberian tigers, five fennec fox and five patagonian caviés.

On-loan ruffed lemurs and Geoffroy cats here from Lincoln Park recently produced two young of each species. Both are rare in captivity, and significant in that we now own 1.0 ruffed lemurs and 1.0 Geoffroy cats. Next, we can have the first females born in each of the species, and can either return the adults to their owner, or surplus the young. Whatever, we have the benefit of the groupings on exhibit, and the possibility of gaining pairs of these endangered species for our permanent collection.

Breeding loans provide zoos the ability to acquire new and endangered species at small cost, while allowing them to retain ownership of surplus animals they do not need at the moment. They will continue to be used, and probably more so, as cooperation between zoos to preserve endangered species increases.



Bongo Bambili Born

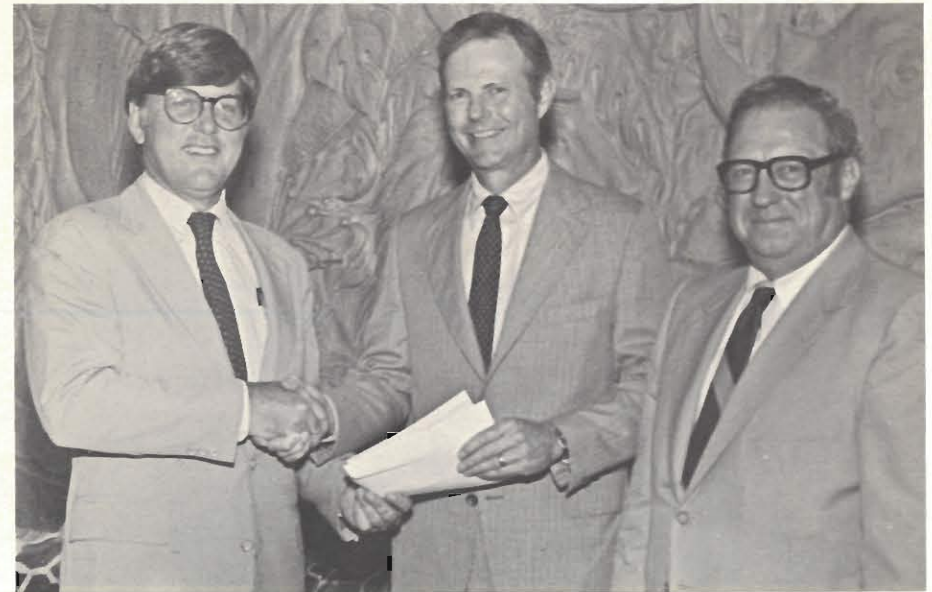
So what was born? A bongo? A bambili? A combination of aforementioned? Baby is a bongo, an African antelope with reddish brown coat, white side-stripes and (eventually) long twisted horns. Zoo director Gilbert K. Boese named her Bambili. It could have been Surprise. Last physical showed mother sexually immature, and breeding has never been observed. Born in the morning, July 31, she is healthy and nursing. Kay Fischer photo.

African Safari Planned

An East African safari through Kenya and Tanzania led by Zoo director Gilbert K. Boese is planned for February. Registration is open to Zoological Society members, only, and is limited to 20.

Participants will visit Aberdare National Park, Lewa Downs, Samburu Game Reserve, Lake Naivasha in the Great Rift Valley, Ngorongoro Crater, Serengeti National Park and Lake Manyara National Park. Stopover is in London.

Individual all-inclusive cost including round-trip air fare from Milwaukee is \$3650. Registrations accompanied by \$1000 deposits will be taken by the Society office, November 1 and following, until all places are filled. The balance is payable December 1. For more information, call the Society office 258-2333.



Kuehn First Corporate Member

The first corporate membership in the Zoological Society has been taken by the Otto L. Kuehn Company, president Kenneth W. Kuehn, center. Accepting the company's \$1000 annual dues are Society directors James Kuehn, right, corporate development committee member, and Richard Gallun, corporate development chairman. Both Kuehns have longtime Society ties. They are nephews of Otto R. Kuehn, Society president 1944-1946, and grandsons of Otto L. Kuehn, one of nine founders of the Society, and its first president 1910-1915. Corporate goal is 25 members by September 1. Walter Roob photo.

Crowned Crane Hatches in May

By William Kopp, Education Department

On May 6, zookeeper Ron Musil noticed the pair of African crowned cranes paying much more attention to the pair of eggs in their nest than they had in the month since they were laid.

Even though the birds had been exhibiting typical nesting behavior, taking turns guarding and incubating, Musil couldn't be sure the eggs were fertile. Whenever he had tried to weigh or candle them, the male would become aggressive and protect the nest. So Musil had decided if the eggs were fertile, a hands-off policy was best.

On May 8, Milwaukee County Zoo had its first crowned crane hatching in over 20 years, since it moved here from Washington Park.

When only one of the two survived the first day, Zoo veterinarian Bruce Beehler decided to pull it and have it hand-raised.

To reduce the chance of imprinting and also, provide company, the chick was introduced to a young jungle fowl. With pecking a learned behavior in the species, the hope was that the crane would learn to eat by observing the fowl.

It worked, and the chick's progress has been excellent. Weight has increased 10 percent a day, and it has begun to feather nicely.

A month ago, the chick's toes began to curl, its rapidly growing body too much for its feet at the time. Splints, along with lumpy straw bedding have corrected it. The bedding with its uneven surface causes the chick to grasp and exercise his toes.

Within a year, in a private area of the Zoo, the chick will be reintroduced to his parents. And next year, with conducive lighting and showers to simulate the rainy season in their native habitat, it is hoped the pair will raise chicks on their own.

The impressive birds range throughout Africa. They are territorial, and prevent other birds from entering their area. They exhibit a defense posture and then false preen before attacking an intruder. The threat display includes fast stamping, which probably accounts for the myth that crowned cranes stamp the ground to scare insects.

Pairs are formed during an elaborate courtship ritual that includes bowing and leaping, which acts to synchronize breeding readiness. They pair for life (about 30 years) and as all cranes, share nest-building, incubating and caring for the young.

African crowned cranes are on exhibit here in the East African yard, along with the Thompson gazelle and impala antelope.



Greg Anton Photo

Discovery Center Summer Run Ends

"Monsters, Myths and Make-Believe," a program that uses snakes, tarantulas and brown bats as it investigates these and other misunderstood wildlife, will complete its summer run in the Zoo Discovery Center, August 29.

The 40-minute program is presented Monday through Saturday at 10, 11, 12:30 and 1:30. Admission is free, but due to space limitations, seats must be reserved by picking up tickets at the Zoo information booth.

The Discovery Center, located in the Children's Zoo, is a converted mobile home. It presents an educational program for Zoo visitors daily, except Sunday, every summer.

Its recent renovation was made possible by the Zoological Society and a bequest from the estate of Ivy Neel Balsom.

Zoo Accessible To Handicapped

A wheelchair parade across Bluemound from St. Camillus Health Center, June 17, marked the beginning of the center's friends' day at the Zoo — and bore witness to the accessibility of the Zoo to those dependent on wheelchairs and walkers.

Residents of St. Camillus, Villa Clement, Lakewood, Marian Catholic and Methodist Manor nursing homes were met by Zoo director Gilbert K. Boese and other members of his staff who then led special guided tours of the Zoo. Visitors saw a demonstration of the elephant management training program, toured the Children's Zoo, lion house, primate building, and other selected exhibits.

The St. Camillus friends day was held at the Zoo for the first time this year, according to Boese, who said he hoped other groups would contact the Zoo about outings, since all the Zoo and its buildings are wheelchair accessible

Marmoset Breeding Successful Here

The marmoset breeding project, started in 1978 to preserve what remained of our collection of the endangered small monkeys — down from 36 to four — will move into larger quarters next month. The inventory requires it. Now totaling 18, it is the work of hospital zookeeper Ron Musil, who was asked to take on the project in the beginning and has directed it since. It was established in the hospital; will move to the commissary.

The high-strung primates, whose name derives from Old French "grotesque figure," originally were on display in the small mammal building. The parasite prosthenocheilus, and difficulties encountered trying to maintain the necessary high humidity, led to the decimation, which is how hospital worker Musil became involved — he assisted at their autopsies.

A spare room in the hospital, where heat, light and humidity could be controlled and sterility maintained, was turned over to re-building the marmoset collection. It is easily identified now by its closed door, with peek-hole in the cardboard that covers its window, and should the door open before morning clean-up, by its stupefying smell. Marmosets are markers, excreting substances to mark their territories and mates.

"It was difficult at the beginning," Musil said. "Marmosets demonstrate considerable aggression, spend a great deal of time harrassing and harranguing their neighbors, and demonstrate their frustrations with neurotic behavior. Plus, they have individual personalities and idiosyncrasies. Some can't stand visual contact. Some can't stand oral contact. Cottontops can't stand Geoffroys. Some will not breed in the presence of others.

"They are highly susceptible to human dis-

ease," Musil continued, "and being small animals with high metabolism, could be wiped out with a germ from one human cold." In the rare instance when others do have contact, or if he is not feeling completely well himself, Musil insists on surgical jacket and mask.

Musil introduced taped music to the marmosets, and found they no longer would startle at the sound of a human voice. It plays constantly now.

Unsocial marmosets — they can be homicidal — have been isolated, sometimes for as much as three months. Musil has found the separated creature to be so delighted at being returned to the group, it will inter-relate at last. "Hostile activities cannot be tolerated," he said. "Miscarriages and abortions result."

By now, every group has bred and had young — blacktail, whitelip, tufted, cottontop and Geoffroys. (The two latter actually are tamarins whose somewhat longer canines make the only difference.)

The marmoset program offers the Zoo participation in zoological research and the preservation of endangered species, Zoo director Gilbert K. Boese pointed out. He also mentioned the desirability of an off-exhibit research program, which can be developed from the animals' viewpoint entirely. Displays sometimes have to compromise the animals' needs — the dichotomy apparent in the exhibit of a secretive animal, for example.

"Marmosets today are valuable," Musil explained. "Their declining numbers in the wild and in captivity accounts for it, and makes the individuals in this collection worth at least \$300 each. Also, they are prized as research animals — their high incidence of twinning suiting them for comparative programs."

Zookeeper Musil with marmoset.



Greg Anton Photo



Milwaukee Journal Photo

This Fathers' Day Special for Tapirs

By Robert Bullerman
Assistant Zoo Director

Father's Day this year began like any other day in June. But at about 10 that morning, a zoo visitor rushed to the keepers working with the elephants to ask if they knew a tapir had just been born in the outside yard.

They finished their elephant session and hurried to the tapir yard. Surprise! Bonnie was a mother, a situation unexpected by everyone due to her girth. And although she shared her yard with Clyde, no breeding had been observed that would result in her firstborn's arrival that day, after a 13-month gestation. Baby, about 14 inches long, and striped, looked like a watermelon on legs.

Area supervisor Richard Pollnow called me. I called Dr. Boese and Dr. Beehler. The keepers were instructed to move the mother and baby inside as soon as possible to prevent the baby's falling into either the dry moat surrounding the exhibit, or the deep pool within it. Although tapirs are excellent swimmers, a newborn would find it difficult to swim in water that deep. Zookeeper Erv Whese carried baby inside. Mother followed.

Dr. Boese and Dr. Beehler arrived to check out the newborn, and to set up watch to see if it would nurse. After some observation, it was determined the mother was not lactating.

Dr. Beehler and keeper Ed Schroeder entered the stall with drugs to induce lactation, easily administered by Dr. Beehler while Schroeder scratched the new mother, now reclining on her side. Then, since tapirs nurse in such a position, they were able to place the baby appropriately.

At this time it was decided to give baby a shot of antibiotics, since we had not been able to

treat the navel area at birth. Dr. Beehler administered it. Baby let out a sharp squeal.

On her feet in an instant, Bonnie charged Schroeder who escaped through the service door, then Beehler who, after some fancy footwork, dashed out after him. It was the first of the aggressive behavior she still demonstrates whenever her stall is opened, behaving as a good mother tapir should.

Nursing began. Bonnie cooperated completely.

Dan Cabunac, Zoo buildings maintenance supervisor, was on duty that day. What, Dr. Boese asked, should the baby be named? Dusan, replied Dan, giving the Serbian name for Daniel.

When we discovered later Dusan was a female, the name became Danielle.

Danielle's is a significant tapir birth, the third at our Zoo (the last in 1960) the first for her parents — and the species is endangered.

And what about Clyde? What did he do when he became a father on Father's Day? He basked in the sunshine seeming content to be a new father, maybe just content to be a tapir.

University at Zoo

The Zoo education department, working with the UWM school of education, this summer presented a four-day program for graduate and undergraduate credit, at the Zoo.

It was one of a series of environmental education workshops offered at institutions specializing in environmental and natural history; Milwaukee Public Museum, Schlitz Audubon Center, and the Riveredge Nature Center. All teaching was done by Zoo staff.

Zookeeper Contest Winner in Demonstration



One of three winners of Pride's Zookeeper-For-A-Day contest, Maureen Still, right, uses the ankus (elephant hook) on Tamara in the management training demonstration held as usual on the day the contest winners took over, July 17. Assisting is Pride member Jill Eaton and zookeeper Rick Pilak. Still, 10 years old, lives in Milwaukee. Other keepers-for-a-day: Patrick Bartels, 10 years old, Waukesha; and Brian Mehlberg, 9, of Milwaukee. A heart monitor and associated equipment have already been purchased for the animal hospital with some of the proceeds. Kay Fischer photo.

Pride Offers Information, Tours, Speakers

Zoo Pride is in the midst of an ambitious volunteer program this summer and making plans for an equally ambitious program for fall.

Each day our members are manning the Zoo's information booth from 9am till 4pm answering questions not only on the Zoo but on points of interest in the city, restaurants, motels, and what highway to take from here to there. Twenty-nine volunteers are giving time to this project.

Pride guides will continue to offer group tours throughout the year. Tours can be tailored to the interest of any group, large or small. (A guided tour is a unique gift.) A tax deductible donation to Zoo Pride is appreciated for each tour. To make arrangements: call Leslie Grinker at 964-0328 or the Zoo Pride office.

Guides are offering free tours for Zoo visitors at 1:30pm on Tuesdays, Wednesdays, Thursdays and Saturdays until September 1. Tours begin at the Asian elephant exhibit where the elephant management demonstration is conducted.

In response to many requests from the community, plans are underway to develop a speakers bureau. Beginning in October, Pride volunteers will offer slide presentations to senior citizen centers, nursing homes, churches, etc. For further information, call Don Byars at 351-5182 or the Zoo Pride office.

Our Zookeeper-For-A-Day contest (June 10-July 10) sponsored by the Pride to raise funds

for the Zoo hospital, attracted more than 850 youngsters who donated \$1 each for a chance to become zookeeper for a day. Three lucky winners selected in a random drawing spent a day behind the scenes. The young zoo keepers approached their assignments with great enthusiasm as they prepared food, fed and groomed animals and, yes, helped clean exhibit areas. Each winner also received a Zoo t-shirt, a train ride and enjoyed lunch with Sam LaMalfa, primates supervisor. If you missed this year's contest, don't worry — you'll have another chance next year.

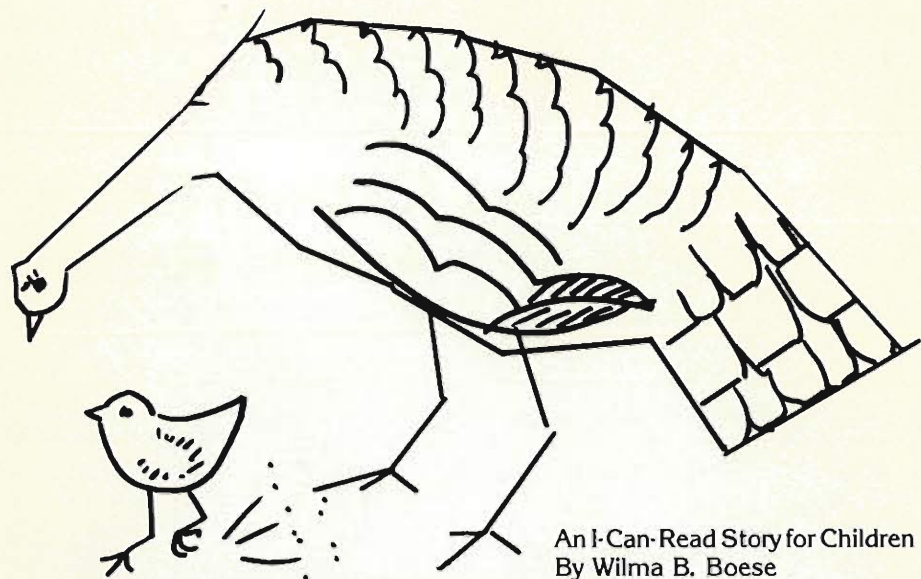
Zoo Pride will again offer a volunteer orientation course on October 7, 10, 21 and 24 (Wednesdays 7:15-9:30pm and Saturdays 9:30-12:30pm). The series of tours and classroom lectures will give new members an educational and entertaining view of our Zoo. To register, call the Pride office 258-5667.

Membership in Zoo Pride is open only to Zoological Society members. Categories are Individual \$5, Family \$7, Sustaining \$25 and Life \$500. To join, send your tax deductible check to Zoo Pride, 10001 West Bluemound, Milwaukee 53226.

Sandi Moomey

Sandi Moomey
President

IRMA AND THE CHICK



An I-Can-Read Story for Children
By Wilma B. Boese

Irma is a wild turkey. She is dark brown. She lives at the Zoo. She is free to walk about the Zoo.

The peacocks with long beautiful tails and the peahens are her friends. Irma roosts with them high in the trees at night. When Irma is hungry, she pecks about the ground for food with the peafowl. She follows the peahens with their chicks all about the Zoo.

There are no other free wild turkeys at the Zoo. Sometimes I say, "It is sad that Irma is all alone." When I see Irma I talk to her. She stops as if to listen to me.

Today as I walk through the Zoo, I see Irma. I see her hiding in the grass. She lies close to the ground. Irma's head and neck are close to the ground. She looks at me with her big round eyes. A brown and yellow chick lies very still next to her. Irma thinks I cannot see her, or her chick.

"I can see you, Irma," I call to her. I stop and look at them. I am surprised to see Irma with a chick.

"What is that you have with you, Irma?" I ask her. Irma has one baby chick.

How can Irma have a chick? Irma is all alone. There is no father for the chick!

Perhaps Irma took the chick from a peahen! Baby turkeys and baby peafowl look alike. Both are brown and yellow.

I ask myself, do mother peahens know how many chicks they have? Do they count them somehow? Would a mother peahen know if one of her chicks was missing?

Hmmm, I wonder. And I think some more.

"No, of course not," I answer my own question. Birds cannot count, I think.

But would Irma take a peafowl chick from a mother peahen? Perhaps she would! Perhaps this really is Irma's chick, a turkey chick.

"Of course it is," I say. "The father of Irma's chick is big Tom Turkey who lives at the farm in Children's Zoo. Tom Turkey is not a wild turkey but he must be the father of Irma's chick."

I ask a zookeeper at the Bird House about Irma's chick. He says, "It think the chick is a peafowl chick and not a turkey chick."

Now I do not know what to believe. I cannot wait to see Irma's chick when it is grown. Do you think it is a turkey chick? We will both have to wait and see!

Now I am happy for Irma. She is not alone. She has a little chick that follows her about the Zoo.

peafowl a large bird with beautiful colored feathers

peacock a father peafowl with long tail feathers that he can spread like a fan

peahen a mother peafowl

roost to sleep above ground as in the trees

chick the baby or young of chicken-like birds such as peafowl and turkeys



Selling popcorn and rummage, the Prairie View school fifth grade made enough money to buy a Nubian goat for the Children's Zoo. Keeper Randy Deer introduced the goat to the children (and vice versa) in June. They named her Sassy. Milwaukee Journal photo.

QUARTERLY Animal Report

1.0.0 Male 0.1.0 Female 0.0.1 Sex Unknown

DONATED

0.0.10	Smallmouth Bass
0.0.10	Largemouth Bass
0.0.1	Lake Sturgeon
0.0.6	Red Oscar Fish
0.0.1	Paddle Fish
0.0.2	Jack Dempsey Fish
0.0.2	Severum Cichlids
0.0.1	Suckermouth Catfish
0.0.24	Various Tropical Fish
1.1	Fox Squirrels
0.0.1	Woodchuck
0.0.1	African Hinged Back Tortoise
0.0.1	Blue and Yellow Macaw
0.0.1	Lesser Sulphur-crested Cockatoo

BREEDING LOAN IN

1.0 Slow Loris

BREEDING LOAN OUT

1.0 Eland
1.1 Otter
1.1 Fennec Fox
0.1 Caracal Cat

EXHIBIT LOAN OUT

0.1 Siberian Tiger
1.0 Polar Bear

SOLD

0.3 Axis Deer
0.1 Arctic Fox
2.0 White-lipped Marmoset
0.1 Greater Kudu
1.2 Cebus Monkey
0.0.3 Prairie Rattlesnake
0.0.1 Blacktailed Rattlesnake
2.0 Mute Swans
0.0.52 Hatchling Burmese Pythons

MOVED

1.0 Andean Condor

SICK

0.0.1 Laughing Gull
1.1 Canada Geese
2.0 Mute Swans
0.0.1 Black Swan
0.1 Mandarin Duck
0.0.1 Speckled Mousebird
1.0 Red-billed Hornbill
0.1 Ruff

BORN/HATCHED

1.1	Ruffed Lemur
0.0.2	Ringtail Lemur
0.0.1	Japanese Macaque
1.1	Geoffroy Cat
0.0.1	Common Marmoset
3.2	Mule Deer
1.0	Impala
1.0	Axis Deer
0.0.1	Colobus Monkey
1.1	Mule Deer
0.1	Scottish Highland Calf
0.1	Malayan Tapir
0.0.40	Burmese Pythons
0.0.2	Humboldt Penguin
0.0.2	African Crowned Crane
0.0.8	Tonkinese Red Jungle Fowl

DIED

1.0 Eland — Collapsing foot joints.
1.0 Pale Fox — Complications of old age.
0.1 Reticulated Giraffe — Inadequate protein intake.
0.1 Fennec Fox — Metastatic liver cancer.
0.1 Dall Sheep — Abscessed lung, blood poisoning.
0.1 American Elk — Complications of old age.
0.0.1 African Crowned Crane — Skull trauma, by parents.

AT THE ZOO

August 1-2 Blue Ridge County Line Band on the restaurant patio Saturday 12-4, Sunday 1-5.

August 2 Ethnic Dance Performances by the Tatra Slovak Dancers starting at 1, Krakow Polish Dancers at 3.

August 8-9 Tripoli Clowns in Children's Zoo Saturday 11-3, Sunday 1-4. **Brew County Rounders Band** on the restaurant patio Saturday 12-4, Sunday 1-5.

August 15-16 Blue Ridge County Line Band on the restaurant patio Saturday 12-4, Sunday 1-5.

August 22-23 Society for the Prevention of Blindness will give free vision screenings to preschoolers in Children's Zoo. **UWM Jazz Combo** on the restaurant patio Saturday 12-4, Sunday 1-5.

August 23 Kandu the Magician & Company perform in the Children's Zoo 1:30 and 3:30.

August 29 Discovery Center last day.

August 29-30 Blue Ridge County Line Band on the restaurant patio Saturday 12-4, Sunday 1-5.

September 1 Registration for Educational Fall Tours Begins. For kindergarten through high school. Call Zoo Education Office 771-3040. Tours start September 21.

September 5-7 Blue Ridge County Line Band on the restaurant patio Saturday 12-4, Sunday and Monday 1-5.

September 20 Kandu the Magician & Company in Children's Zoo 1:30 and 3:30.

September 21 Fall Tours Start.

October 4 Children's Zoo Run. Two-mile family run through the Zoo and 10,000 meter run from the Zoo to Watertown Plank and back. Directed by Badgerland Striders. T-shirts to all registered runners, trophies to winners. Registration forms available in September.

October 10 Fall Walk for Zoological Society 9:30-11:30. Registration begins September 1 — limited to 100. Call Zoo education office.

October 31 Halloween at the Zoo! Scavenger hunt sheets available from 10-1. Costume contest parade at 1. For ages 3-12. Prizes for best costumes. Dress for the weather — contest outside.

November 7 Zoo Photography Workshop starts. Only 12 openings left. Cost to Society members \$10.

November 17-20 Turkey Days.

November 21 Zoo Photography Workshop concludes.

December 12 Animal Ornaments. Caroling with Santa.



ALIVE

Carol Moore Waite, Editor

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